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from: **The Dow Chemical Company**
Intellectual Property
P.O. Box 1967
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January 18m 2006

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European Patent Office
P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk – Pays Bas
Netherlands

Attn: Authorized Officer H. Schmidt

Re: International Patent Application No. PCT/US2005/008945
Entitled: FILM LAYERS MADE FROM POLYMER FORMULATIONS
Dow Case No. 63500A

Dear Sir/Madam:

Following is a Response to the Written Opinion for the above-identified Interantional Patent Application.

Regards,

James T. Hoppe
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JTH/mfg

IN THE EUROPEAN PATENT OFFICE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY (IPEA/EP)

Applicant(s): DOW GLOBAL TECHNOLOGIES INC.
(Mridula Kapur et al.)

International Application No.: PCT/US2005/008945

Filed: 18 March 2005

For: FILM LAYERS MADE FROM POLYMER FORMULATIONS

REFERENCE: 63500A

Authorized Officer: H. Schmidt

AMENDMENT UNDER ARTICLE 34(2)(b)

Dear Sir/Madam:

Please amend the indicated claims as follows:

CLAIMS:

1. (amended) A film comprising at least one layer made from a polymer composition, wherein the composition comprises:

(A) from 35 to 65 percent by weight of the composition of an ethylene polymer having a density of greater than or equal to about 0.94 g/cm^3, a melt index from 0.001 to 1 grams/10 minutes, and

~~(B)~~from 35 to 65 percent by weight of the composition of an ethylene polymer having a density greater than or equal to about 0.94 g/cm^3, a melt index from 50 to 700 grams/10 minutes~~.~~

~~The film of claim 1,~~ wherein (A) comprises at least one homogeneously branched interpolymer having a molecular weight distribution (Mw /Mn) from 1.5 to 3.

2. (cancelled)

3. The film of claim 1, wherein the film layer has a water vapor transmission rate, WVTR, of less than or equal to about 0.3 g-mil/(100 in^2 x day), as measured in accordance with ASTM F 1249-90.

4. The film of claim 1 wherein (A) and (B) are each an ethylene homopolymer.

5. An ethylene homopolymer or interpolymer composition having a percentage fraction of a GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as determined by gel permeation chromatography with a low angle laser light scattering detector is at least 2.5 percent but no more than about 20 percent of the total area of the GPC-LS chromatogram.

6. An ethylene homopolymer or interpolymer composition having a percentage fraction of a GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is no more than about 25 percent but at least about 10 percent of the total area of the GPC-RI chromatogram.

7. The ethylene composition of claim 5 wherein the percentage fraction of a GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is no more than about 25 percent but at least about 10 percent of the total area of the GPC-RI chromatogram.

8. The ethylene composition of Claim 7 wherein the percentage fraction of the GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as determined by gel permeation chromatography with a low angle laser light scattering detector is equal to or less than about 15 percent of the total area of the GPC-LS chromatogram, and wherein the percentage fraction of a GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 15 percent of the total area of the GPC-RI chromatogram.

9. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as determined by gel permeation chromatography with a low angle laser light scattering detector is equal to or less than about 10 percent of the total area of the GPC-LS chromatogram, and wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 20 percent of the total area of the GPC-RI chromatogram.

10. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 15 percent of the total area of the GPC-RI chromatogram.

11. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 20 percent of the total area of the GPC-RI chromatogram.

12. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as determined by gel permeation chromatography with a low angle laser light scattering detector is equal to or less than about 15 percent of the total area of the GPC-LS chromatogram.

13. The ethylene composition of claim 8, wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 20 percent of the total area of the GPC-RI chromatogram.

14. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as determined by gel permeation chromatography with a low angle laser light scattering detector is equal to or less than about 10 percent of the total area of the GPC-LS chromatogram.

15. The ethylene composition of claim 14, wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 15 percent of the total area of the GPC-RI chromatogram.

16. A film comprising at least one layer made from the polymer composition of any one of the preceding claims.

Replacement pages are hereby submitted.

Remarks

The above amendments merely combined dependent claim 2 into independent Claim 1. Accordingly no new matter has been presented and the entry of such amendments is proper.

In the Written Opinion, the Examiner espoused the view that the claims of the present invention were not inventive over some combination of the following references:

D1 BE-A-2002/0456

D2 US A 5494965

D3 WO A 00/3414

D4 WO A 02/74816

Applicants respectfully contest this assertion for the following reasons.

Initially, the Applicants' believe that there is an error in the reference number provided for D3 (both in the written opinion and in the search report). The number cited relates to a "feedthrough overlap coil" which does not appear to be related to

the present invention in any way. Moreover the examiner has referred to example "21f" and the reference cited does not have any example numbered as such. The correct reference number for D3 is therefore courteously requested.

The Applicants have discovered specific compositions of polyethylene materials which exhibit a surprising balance between processability and WVTR performance. None of the references cited in the Written Opinion disclose the specific polymers claimed, nor give any guidance to narrowing broadly disclosed ranges in a manner which would result compositions corresponding to the present claims. As summarized at page 28 of the present specification, "In this invention, contrary to the current understanding of the MWD-LCB-WVTR relationship, we have discovered that broad MWD resins with good WVTR performance can be made. This was achieved by utilizing a single site-metallocene catalyst, a bimodal MWD, and elimination of high molecular weight fractions. Surprisingly, the LCB from a single-site constrained geometry catalyst does not cause the undesired shish kabob morphology. Thus, a bimodal single site constrained geometry- based HDPE molecular architecture provides improved processability and at the same time provides a better barrier to water vapor transmission."

D1 teaches a multimodal ethylene polymer where one component has an I_2 of at least 10, and the other has an I_2 less than 10. "At least 10" is a much broader range than Applicant's 50 to 700, and similarly "less than 10" is much broader than 0.001 to 1. Thus D1 does not teach nor suggest the specific ranges of I_2 in the present claims. More importantly however, D1 does not teach or suggest that the component with the low I_2 should have an Mw/Mn from 1.5 to 3. This range of Mw/Mn is characteristic of constrained geometry catalysts. These narrow Mw/Mn values also indicate a narrow Mz/Mw ratio which indicates a reduction in both high molecular weight breadth and fraction compared to other catalysts that produce Mw/Mn ratios greater than 3 which the Applicants determined can induce shish-kabob morphology that is detrimental to WVTR performance. However, as processability is aided by a broad Mw/Mn range, the overall composition includes a second component which also lacks large amounts of the high molecular weight

fraction (which as explained above has been determined to be detrimental to WVTR performance), as indicated by the overall I_2 being greater than 50. D1 on the other hand does not teach or suggest the avoidance of high molecular weight fractions in either component as the high molecular weight component (i.e. the component with the low I_2) has a relative broad Mw/Mn, and the low molecular weight component is not necessarily as low as required in the present claims (at least 10 vs. at least 50).

Claims 5-15 of the present application claim this combination of broad overall Mw/Mn without a large amount of HMW fraction by referring to analytical results commonly used to assess these parameters. Thus, since D1 does not teach limiting the high molecular weight fraction in a composition having a broad Mw/Mn, then its compositions would also not meet these claims.

Similarly D2 teaches that the preferred catalysts for both components are Ziegler-type catalysts (see, for example column 6, lines 37-40). As is well known in the art, Ziegler type catalysts tend to produce polymers having a higher value for Mw/Mn than the constrained geometry catalysts, and therefore would be expected to have a significant high molecular weight tail, which is sought to be minimized in the present application by the use of the constrained geometry catalyst. Thus, D2 also fails to teach or suggest the invention described in the present claims.

D4 does not teach the benefit obtained when using a more balanced split between the two components. At page 11, lines 10-14 show a general preference towards reduced amounts of the high molecular weight part (i.e. the low melt index component). This preference is reiterated in the Examples, particularly in Table VI which shows in the column labeled "Split" that all Examples are outside the required ranges recited in the claims. Thus none of these Examples would exhibit the balanced WVTR and processability characteristics observed in the compositions of the present claims. Thus D4 also fails to teach or suggest the invention as now claimed.

Accordingly, as the references cited by the Examiner fail to teach or suggest the specific combination of elements currently claimed, the Applicants courteously request a favorable preliminary examination report.

Respectfully submitted,

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18 January 2006
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CLAIMS:

1. A film comprising at least one layer made from a polymer composition, wherein the composition comprises:

(A) from 35 to 65 percent by weight of the composition of an ethylene polymer having a density of greater than or equal to about 0.94 g/cm^3, a melt index from 0.001 to 1 grams/10 minutes, and

from 35 to 65 percent by weight of the composition of an ethylene polymer having a density greater than or equal to about 0.94 g/cm^3, a melt index from 50 to 700 grams/10 minuteswherein (A) comprises at least one homogeneously branched interpolymer having a molecular weight distribution (Mw /Mn) from 1.5 to 3.

2. (cancelled)

3. The film of claim 1, wherein the film layer has a water vapor transmission rate, WVTR, of less than or equal to about 0.3 g-mil/(100 in^2 x day), as measured in accordance with ASTM F 1249-90.

4. The film of claim 1 wherein (A) and (B) are each an ethylene homopolymer.

5. An ethylene homopolymer or interpolymer composition having a percentage fraction of a GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as determined by gel permeation chromatography with a low angle laser light scattering detector is at least 2.5 percent but no more than about 20 percent of the total area of the GPC-LS chromatogram.

6. An ethylene homopolymer or interpolymer composition having a percentage fraction of a GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is no more than about 25 percent but at least about 10 percent of the total area of the GPC-RI chromatogram.

7. The ethylene composition of claim 5 wherein the percentage fraction of a GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is no

more than about 25 percent but at least about 10 percent of the total area of the GPC-RI chromatogram.

8. The ethylene composition of Claim 7 wherein the percentage fraction of the GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as determined by gel permeation chromatography with a low angle laser light scattering detector is equal to or less than about 15 percent of the total area of the GPC-LS chromatogram, and wherein the percentage fraction of a GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 15 percent of the total area of the GPC-RI chromatogram.

9. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as determined by gel permeation chromatography with a low angle laser light scattering detector is equal to or less than about 10 percent of the total area of the GPC-LS chromatogram, and wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 20 percent of the total area of the GPC-RI chromatogram.

10. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 15 percent of the total area of the GPC-RI chromatogram.

11. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 20 percent of the total area of the GPC-RI chromatogram.

12. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as

determined by gel permeation chromatography with a low angle laser light scattering detector is equal to or less than about 15 percent of the total area of the GPC-LS chromatogram.

13. The ethylene composition of claim 8, wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 20 percent of the total area of the GPC-RI chromatogram.

14. The ethylene composition of claim 7, wherein the percentage fraction of the GPC-LS chromatogram which has a molecular weight equal to or greater than 1,000,000 as determined by gel permeation chromatography with a low angle laser light scattering detector is equal to or less than about 10 percent of the total area of the GPC-LS chromatogram.

15. The ethylene composition of claim 14, wherein the percentage fraction of the GPC-RI chromatogram which has a molecular weight equal to or less than about 10,000 as determined by gel permeation chromatography with a differential refractometer is equal to or greater than about 15 percent of the total area of the GPC-RI chromatogram.

16. A film comprising at least one layer made from the polymer composition of any one of the preceding claims.